

What is claimed is:

1. An etching method for, by a plasma etching unit, removing portions of a bottom antireflective coating not covered by an etching mask made of a photoresist material and having a desired shape for performing a selective etching process on a process-object film on a semiconductor substrate, said bottom antireflective coating being located between said process-object film and said photoresist material to prevent exposing rays from reflecting off the surface of said process-object film and traveling back up through said photoresist material when said photoresist material for forming said etching mask is selectively exposed to said rays to create said etching mask, comprising:

obtaining an ethyl alcohol addition ratio in a mixed gas not exhibiting isotropic etching characteristics to said etching mask by using a mixed gas of ethyl alcohol, oxygen and nitrogen as an etching gas in said plasma etching unit;

and

performing said etching process in said etching unit by using said etching gas, including ethyl alcohol, supplied at an addition ratio determined based on said obtained ethyl alcohol addition ratio to thereby remove the portions of said bottom antireflective coating not covered by said etching mask.

2. An etching method according to Claim 1, wherein operating conditions of said etching unit for obtaining said ethyl alcohol addition ratio not exhibiting the isotropic etching characteristics are that a high-frequency power source voltage of said etching unit is 0 volt, and that an etching gas, including ethyl alcohol supplied at a determined addition ratio based on an ethyl alcohol

addition ratio when an etching rate of said etching mask is zero under said operating condition.

3. An etching method according to Claim 1, wherein said addition ratio of ethyl alcohol included in said etching gas is set at a value about 5% higher than said ethyl alcohol addition ratio.

4. An etching method according to Claim 1, wherein said photoresist material and said bottom antireflective film are both made of an organic material, and wherein said process-object film is made of a metal or silicon material.

5. An etching method according to Claim 1, wherein flow rates of said mixed gas are 35ccm, 35ccm and 30ccm for oxygen, nitrogen and ethyl alcohol, respectively.

6. A method for etching an antireflective film located under an etching mask made of a photoresist material, the method comprising:

forming a first film over a semiconductor substrate, the first film being to be etched;

forming the antireflective film on the first film;

forming the etching mask on the antireflective film;

removing portions of the etching mask to expose portions of the antireflective film;

obtaining an ethyl alcohol addition ratio in a mixed gas not exhibiting isotropic etching characteristics to said etching mask by using mixed gas of ethyl alcohol, oxygen and nitrogen as an etching gas; and

etching the exposed portions of the antireflective film by using said etching gas, including ethyl alcohol, supplied at an addition ratio determined based on said obtained ethyl alcohol addition ratio.

7. An etching method according to Claim 6, wherein operating conditions of a plasm etching unit for obtaining said ethyl alcohol addition ratio not exhibiting the isotropic etching characteristics are that a high-frequency power source voltage of said etching unit is 0 volt, and that an etching gas, including ethyl alcohol supplied at a determined addition ratio based on an ethyl alcohol addition ratio when an etching rate of said etching mask is zero under said operating condition.

8. An etching method according to Claim 6, wherein said addition ratio of ethyl alcohol included in said etching gas is set at a value about 5% higher than said ethyl alcohol addition ratio.

9. An etching method according to Claim 6, wherein said photoresist material and said antireflective film are both made of an organic material.

10. An etching method according to Claim 6, wherein flow rates of said mixed gas are 35ccm, 35ccm and 30ccm for oxygen, nitrogen and ethyl alcohol, respectively.

11. A method for fabricating a semiconductor device, the method comprising:

forming a first film over a semiconductor substrate, the first film being to be etched;

forming an antireflective film on the first film;

forming an etching mask made of a photoresist material on the antireflective film;

removing portions of the etching mask to expose portions of the antireflective film;

obtaining an ethyl alcohol addition ratio in a mixed gas not exhibiting isotropic etching characteristics to said etching mask by using mixed gas of ethyl alcohol, oxygen and nitrogen as an etching gas;

etching the exposed portions of the antireflective film to expose portions of the first film by using said etching gas, including ethyl alcohol supplied at an addition ratio determined based on said ethyl alcohol addition ratio; and

etching the exposed portions of the first film.

12. A fabricating method according to Claim 11, wherein operating conditions of a plasma etching unit for obtaining said ethyl alcohol addition ratio not exhibiting the isotropic etching characteristics are that a high-frequency power source voltage of said etching unit is 0 volt, and that an etching gas, including ethyl alcohol supplied at a determined addition ratio based on an ethyl alcohol addition ratio when an etching rate of said etching mask is zero under said operating condition.

13. A fabricating method according to Claim 11, wherein said addition ratio of ethyl alcohol included in said etching gas is set at a value about 5% higher than said ethyl alcohol addition ratio.

14. A fabricating method according to Claim 11, wherein said photoresist

material and said bottom antireflective film are both made of an organic material.

15. A fabricating method according to Claim 11, wherein flow rates of said mixed gas are 35ccm, 35ccm and 30ccm for oxygen, nitrogen and ethyl alcohol, respectively.